554

VOLUME 80 SEPARATE No. 554

PROCEEDINGS

AMERICAN SOCIETY OF CIVIL ENGINEERS

NOVEMBER, 1954

COOPERATION BETWEEN INDUSTRIES AND REGULATORY AGENCIES

John E. Kinney, A.M. ASCE

SANITARY ENGINEERING DIVISION

{Discussion open until March 1, 1955}

Copyright 1954 by the AMERICAN SOCIETY OF CIVIL ENGINEERS
Printed in the United States of America

Headquarters of the Society
33 W. 39th St.
New York 18, N. Y.

PRICE $0.50 PER COPY

THIS PAPER

--represents an effort by the Society to deliver technical data direct from the author to the reader with the greatest possible speed. To this end, it has had none of the usual editing required in more formal publication procedures.

Readers are invited to submit discussion applying to current papers. For this paper the final date on which a discussion should reach the Manager of Technical Publications appears on the front cover.

Those who are planning papers or discussions for "Proceedings" will expedite Division and Committee action measurably by first studying "Publication Procedure for Technical Papers" (Proceedings — Separate No. 290). For free copies of this Separate—describing style, content, and format—address the Manager, Technical Publications, ASCE.

Reprints from this publication may be made on condition that the full title of paper, name of author, page reference (or paper number), and date of publication by the Society are given.

The Society is not responsible for any statement made or opinion expressed in its publications.

This paper was published at 1745 S. State Street, Ann Arbor, Mich., by the American Society of Civil Engineers. Editorial and General Offices are at 33 West Thirty-ninth Street, New York 18, N. Y.

COOPERATION BETWEEN INDUSTRIES AND REGULATORY AGENCIES

John E. Kinney,[1] A.M. ASCE

Cooperation between industries and regulatory agencies in pollution abatement—this can be construed to mean compliance by industry with the orders of a regulatory agency; or it can summarize a joint effort to exert collective judgment in pollution abatement programs so as to achieve economic protection of our water resources.

All of us have known companies that have complied with orders. In some cases this compliance resulted from a compromise of opinions between regulatory agency and industry. But the act represented the attitude and activity of a single company. Now a new interpretation of cooperation commands attention. An account of current developments in the Ohio River basin may indicate some useful application of cooperative relationships in pollution control programs elsewhere.

This account may also provide suggestions for the critics of pollution abatement programs who exert their efforts to show that the regulatory agency is unreasonable—not to show by factual data what should be done. The nature lover who demanded "clean" streams was often the incentive in the past for pollution abatement. He couldn's define clean streams but he could demand them. And that demand was strong enough to cause the passage of legislation that calls for clean streams by stating that no deleterious or toxic substances can be discharged to the waterways. The basis for defining toxicity is not stated. Now his counterpart criticizes pollution control programs by attacking the objectives, the procedures, the mechanics and the data supporting requirements. But seldom does he provide the assistance needed to accomplish what he claims as his aim—practical pollution abatement.

The story of cooperation in the Ohio valley had its start in the desire of the inhabitants of eight states draining into the Ohio River to consider their pollution problems of common interest but local concern. This mutual agreement to solve their own problems was formalized in a compact establishing the Ohio River Valley Water Sanitation Commission. The compact reflected the attitude of cooperation. It encouraged the Commission to counsel with those who were discharging wastes to the streams.

The Commission invited management representatives of several companies in each of seven industries to help promote the pollution abatement program in the Ohio valley. Industry management responded and separate "industry action committees" were organized. Membership was voluntary. The committees were asked to supply factual data that would define the extent of the industry's waste problem and to offer advice on how those waste discharges might be abated.

By inviting representatives of several companies in each industry, there was recognition that many talents and resources were necessary to expedite pollution abatement. When industry agreed to pool knowledge there was recognition that duplication of effort was a needless waste. But establishing

1. San. Eng. Ohio River Valley Water Sanitation Comm., Cincinnati, Ohio.

committees of several companies in each industry has more significant connotations. There is, if you will, the application of geometry rather than algebra to the promotion of pollution abatement. There have been other joint efforts that have resulted in committees with representatives of several industries. The objective of such a group would be an algebraic equation for the solution of their waste problems. Concentrating on the problems of generic industries individually, suggests that while there are principles—or theorems—common to all industries, the application will vary because of inherent differences among industries. Time has proved the feasibility of this viewpoint.

Generally the committee of representatives of several industries is formed by invitation to individuals. The individual's suggestions represent his own opinions. He is usually not being asked to represent the views of his company. And he does not speak for the whole industry. But when company management representatives offer suggestions, company policy is reflected. When several companies reach agreement on a subject, then diverse viewpoints have been reconciled. Other companies in that industry can accept the recommendations with that assurance.

This joint effort is aimed at avoiding duplication. There is effective liaison between the committees. In addition, a member of the Commission staff works with each committee and acts as coordinator. Four of the committees have a Commission member meet with them.

Here is a regulatory agency recognizing industry as the best authority on its waste problems. Here also is a mutual recognition that new data are required to properly define the industrial waste problem. The success of such a joint program is directly proportional to the degree of mutual confidence developed. The regulatory agency must have confidence that the data supplied by industry is factual; industry must have confidence that the data will be used to the best advantage of all.

Such joint activity is not an abrogation of the responsibility of regulatory agencies to set requirements. It is a recognition that the regulatory agency, charged with protecting downstream water uses, may have to adopt requirements based on meager knowledge. It is also a recognition that there are industries that have objected to pollution abatement programs through a lack of understanding of the need.

Defining the need for treatment and the degree of treatment necessary to satisfy the need is the objective of the Ohio River Commission. Its committees are assisting in achieving that objective. They realize that the need will vary depending on the use of the stream and the quality of water necessary to protect that use. Construction of inadequate treatment facilities will not provide the desired protection. But when excess treatment is provided money is wasted.

In defining the need for treatment and the degree of treatment necessary to satisfy the need, we must know how to measure the pollutional effects of waste, what the effects of these wastes are on subsequent water uses, and the means to treat the wastes so as to neutralize these pollutional effects.

Analytical Procedures

Analytical procedures found adequate for sewage treatment plant design and operation have been applied to the measurement of industrial wastes. Other tests have been adopted from water treatment plant operation. There have been many complaints about the inadequacies of some of these tests for measuring industrial wastes. Industry committees are doing more than

complaining. They have established sub-committees to recommend analytical procedures that will measure the effects of their wastes. The full committees then act as field-testing agencies so that when the methods are recommended they have been well checked.

There are several long established groups doing excellent work in developing methods of analysis. Why the apparent duplication by the Commission's industry committees? These committees have been asked to recommend the methods that measure the pollutional effects of their wastes. Proposing these recommendations to regulatory agencies calls for supporting data. Also, treatment plants will be designed on the basis of the analyses. The companies are relying on the accuracy of the methods so that the treatment facilities when constructed will accomplish the desired results.

An example of what this means. At present some requirements have stipulated that the concentration of oil in an oil refinery effluent shall not exceed 30 ppm. Oil separators have been constructed that satisfy that requirement. Now the oil refining industry has recommended a change in the analytical procedure for oil. The new procedure shows approximately twice the concentration measured by the older method. Adoption of this new procedure means that oil refinery separators that in the past have been adequate now seem inadequate. However, if the regulatory agency recognizes that the resulting effluent is still the same, then 60 ppm should be a permissible limit when the oil concentration is measured by the new method. In proposing this new analytical procedure as being the more accurate the correlation between the two methods must be demonstrated. Both industry and the regulatory agency need the data.

These committees will work with any agency developing analytical procedures. But they are showing no single allegence. There is direct liaison with the American Society for Testing Materials, the American Petroleum Institute and the joint Standard Methods Committee. However, the objective is not to coerce any of these groups into endorsing the industry committee recommendations. Nor is it to develop "the" standard method. At present each industry committee is concerned only with obtaining methods applicable to its own industry. At some later date an effort will be made to reconcile differences.

With the recommendation of a method of analysis by an industry committee there is a check made to determine the correlation with the procedures used by the U. S. Geological Survey in stream analysis and with the procedure used by the Kettering Laboratory in Cincinnati in toxicity studies. Such correlation is essential if reduction of a waste is to result in the quality of water desired in the stream. The methods are also reviewed by the eight state regulatory agencies.

The industry committees have also established a joint committee on sampling procedures. All recognize the need for a representative sample. But no one has detailed the procedure for collecting one. This joint committee, including regulatory agency and USGS representatives, is outlining the precautions to be observed in taking samples for specific analyses.

Effects of Pollution

The second phase of this joint program calls for a determination of the effects of wastes on subsequent water uses. We have wide variation in state requirements. Literature available would give support to even wider interpretations. The Commission has established a project at Kettering Laboratory, at the University of Cincinnati School of Medicine, to determine the physiologically safe limits for industrial contaminants in the water supplies of man and

animals. Recommendations on water quality criteria can be based on qualified evaluation of all available data. No longer will the criteria for water quality be expressed only in terms of a symbol and a figure. Rather, the supporting data for any recommendation will be given to permit an engineering appraisal of a situation that does not meet the recommended level. These supporting data also define the necessity for treating wastes.

The industry committees are supporting this program by abstracting the literature on cards designed by Kettering. The National Cash Register Company has abstracted over 1,500 articles on some 13 ions for the metal-finishing committee. The American Iron and Steel Institute is financing the abstracting of literature on another 14 contaminants at the request of the steel committee. Other committees are developing similar programs.

Another effect of pollution is the killing of fish—long a symbol of pollution. The compact establishing the Commission—as well as state laws—requires the waters to be maintained in a condition suitable for fish life. The law does not state the kind of fish nor the quantity of fish. The Commission has enlisted the assistance of a team of eight of the country's leading aquatic life biologists to define what is meant by water suitable for fish life. A definition has been determined. Criteria for measuring suitability are now being developed. And the development of the criteria utilizes the assistance of the industry committees so that the results can be interpreted correctly by industry. The biologists do not define the quality of water desired in any stream. Rather, they provide the data necessary for evaluation of the importance of fish life and the water quality required to protect it or to permit fish life propagation.

Pollution also affects industrial process operations. Industry is a prime user of water. So the industry committees are determining the effects of other industrial wastes and sewage on their operations, as well as the quality of water best suited for those operations.

Industrial wastes affect water supplies of municipalities as well as industries. A committee of water treatment plant operators—industrial and municipal— provide factual data on the effects of high concentrations of contaminants on plant operations. There is liaison between this committee and the industry committees.

Waste Control Measures

The third phase of this program calls for providing control measures. Control of wastes can be accomplished in one of two ways. The first is to reduce wastes by good housekeeping or by plant-process changes. The second is to treat the wastes by chemical, physical, or biological means. The first can save money; the second costs money. To do the first requires a knowledge of the plant operation—a natural for industry committees. With an understanding of the objectives of pollution abatement, there is the incentive to really define their waste problems. The committees have organized surveys within the industries to accomplish this.

The results have been effective. So also has the adoption of good housekeeping suggestions. Phenol discharged from coke plants is now about one-fifth that discharged from older designed plants. Utilization of waste water for make up in other operations and installation of indirect coolers made the difference. A metal-finishing plant reduced its loss of copper to the stream by 68% with the installation of save-rinse tanks. Another company that was losing about 400 lbs. of cyanide a month to the stream now loses only one-sixth of that after installing a new type rinsing device. Here are cases of

industry listening to industry. Many of these devices for reducing waste have been known for years. But to many, their use is only now apparent.

For some wastes there are a variety of methods of treatment. There are differences in the degree of purification that each will provide. There may also be a difference in the cost of these methods. These industry committees are developing the criteria by which a plant can select the method that will satisfy its requirements. The objective is to provide adequate treatment at least cost.

For certain other wastes there are no known treatment methods. In some instances methods have been proposed but have not yet received field-test. Rather than make each company duplicate the efforts of other companies and attempt to evaluate all suggested processes, these industry committees have pooled their resources and talents so as to speed up the evaluation of proposed methods and the development of new methods.

Men in industry are learning that pollution abatement in reality means water conservation. Others are receiving proof of the need of pollution abatement by learning of the effects of their wastes. Treatment requirements can make sense if there is really a need. The industry committees of the Commission represent steel, metal-finishing, oil refining, coal, organic chemical, chemical salts and distillery industries. Over 150 members of industry are on these teams. The seriousness is recognized. So also was the sincerity of the Commission's invitation to industry for advice on promoting a realistic program.

These committees do not define either in method or in degree what any company has to do. Neither do they endorse nor recommend treatment methods. Rather, their activities point up the need for true consulting on industrial waste problems. Industry is cost conscious. It also recognizes responsibility. Add to this physical limitations within a plant and the need for evaluation of available methods of treatment is apparent. Now add to that the concept that waste treatment in industry is a step in process and you can see that knowledge of plant operations is essential. Yet the need for treatment is measured by the effect of the waste on the stream—the realm of sanitary engineering.

Design of isolated industrial waste treatment facilities can be handled by competent civil, chemical, mechanical or sanitary engineers. But with the acceptance of industrial wastes into municipal sewers, the problem of design is for sanitary engineers. Sanitary engineers are faced with the alternatives of developing new design criteria—so that sewerage and sewage treatment can be a utility for the common good of all— or provide blanket restrictions on industrial waste.

With all of these facets requiring consideration, the importance of the sanitary engineer in industrial waste treatment should be apparent. He cannot be ignored—nor can he ignore his dependence on other fields of engineering and science. Team work is a necessity. The position of the sanitary engineer on the team depends on his ability as an administrator, on his ability to visualize the objectives and coordinate the over-all effort. His limitations are defined by his ingenuity and imagination. The Commission's advisory committees include vice-presidents, directors of research, process engineers, design engineers, chemists, lawyers, men removed from technical pursuits and men whose pursuit is medicine or aquatic biology. But the activity of these committees is a joint effort with sanitary engineers of the regulatory agencies to achieve pollution abatement.

AMERICAN SOCIETY OF CIVIL ENGINEERS

OFFICERS FOR 1955

PRESIDENT

WILLIAM ROY GLIDDEN

VICE-PRESIDENTS

Term expires October, 1955:
ENOCH R. NEEDLES
MASON G. LOCKWOOD

Term expires October, 1956:
FRANK L. WEAVER
LOUIS R. HOWSON

DIRECTORS

Term expires October, 1955:
CHARLES B. MOLINEAUX
MERCEL J. SHELTON
A. A. K. BOOTH
CARL G. PAULSEN
LLOYD D. KNAPP
GLENN W. HOLCOMB
FRANCIS M. DAWSON

Term expires October, 1956:
WILLIAM S. LaLONDE, JR.
OLIVER W. HARTWELL
THOMAS C. SHEDD
SAMUEL B. MORRIS
ERNEST W. CARLTON
RAYMOND F. DAWSON

Term expires October, 1957:
JEWELL M. GARRELTS
FREDERICK H. PAULSON
GEORGE S. RICHARDSON
DON M. CORBETT
GRAHAM P. WILLOUGHBY
LAWRENCE A. ELSENER

PAST-PRESIDENTS

Members of the Board

WALTER L. HUBER
DANIEL V. TERRELL

EXECUTIVE SECRETARY
WILLIAM N. CAREY

TREASURER
CHARLES E. TROUT

ASSISTANT SECRETARY
E. L. CHANDLER

ASSISTANT TREASURER
GEORGE W. BURPEE

PROCEEDINGS OF THE SOCIETY

HAROLD T. LARSEN
Manager of Technical Publications

DEFOREST A. MATTESON, JR.
Editor of Technical Publications

PAUL A. PARISI
Assoc. Editor of Technical Publications

COMMITTEE ON PUBLICATIONS

SAMUEL B. MORRIS, *Chairman*

JEWELL M. GARRELTS, *Vice-Chairman*

GLENN W. HOLCOMB
OLIVER W. HARTWELL
ERNEST W. CARLTON
DON M. CORBETT